NCST Advisory Committee
Recommendations based on Briefings of 12-10-12
Draft of 12-11-12
Revised 1-4-13
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The Committee acknowledges with thanks the presentation of the NCST program by NIST staff. Our overall appraisal of the program is highly favorable. We appreciate the candid and thorough response to our request for an account of how NIST acted upon our 2011 recommendations. The following recommendations are based on the December 10, 2012 meeting. They -primarily express our priorities and our sense that elements of the NCST program need to be advanced more rapidly.

Our broad recommendation is that Congress consider expanding the scope and effort of NIST for NCST activities. Implementing the findings of NCST investigations, past and future, will save lives and reduce property losses. Even modest expansion of the program, consistent with the recommendations below, will have major benefits.

Recommendations

1. As in 2011, the Committee enthusiastically endorses NIST's plan to develop a database of information on structural performance in earthquakes, fire, wind and other extreme events. We recommend that development of the database be accelerated. The Committee notes that design drawings of structures that are the subjects of investigations are currently being incorporated in the database as scanned images. In the future, database users will benefit from access to drawings in electronic form such as that used in commercial Building Information Management/Modeling (BIM) software. The Committee recommends that NIST configure the database to accommodate electronic drawings.

2. The Committee expresses confidence that the NIST technical staff is aware of approximations and uncertainties in modeling approaches, such as maximum wind speed and other parameters of the Rankine vortex model for tornado wind speed distribution. We urge NIST staff to exercise care to inform less sophisticated audiences regarding the sensitivity of modeling outcomes to parameter uncertainties and recommendations that follow from assumptions. Such warnings will In turn alert less sophisticated users to the need for caution in interpreting the results of analyses that may be significantly influenced by assumptions and approximations. The Committee suggests that uncertainties may be addressed in statements covering fitness for use.

3. The Committee urges that data gathering should lead to enhanced public welfare through improved life safety and community resilience. Data gathering by NCS Teams should therefore be expanded to include infrastructure as well as buildings. It is anticipated that some facilities, such as hospitals and public safety buildings, and infrastructure elements, such as water and power distribution, may deserve designs to resist higher intensities of extreme events than

other facilities. Such prioritization is accepted in earthquake-prone areas, a fact that may be helpful in prioritizing building and infrastructure use types for the broader range of hazards investigated by NCS Teams.

4. The Committee recommends that NIST advance the social science element of the Joplin tornado investigation, and of investigations of other events such as Superstorm Sandy, affecting broad geographical areas to understand how behavior contributed to casualties. To the extent that modified behavior would reduce casualties, it is recommended that NIST undertake or become a prime contributor to a program of science-based public information and education regarding how behavior can be modified to mitigate casualties in low frequency, high impact events such as tornados and hurricanes. In this regard, the Committee recommends that NIST should collect specific information on the effectiveness of shelters in protecting those who used or tried to use them.

5. The Committee recommends that more events should be investigated. The decision-making criteria, leading to scoring on a 4-point scale, appear to be appropriate. However, valuable data are being lost because events with moderately high priority in the range 3-3.5 are not being investigated. The Committee strongly endorses NIST's decision to participate in the FEMA investigation of Superstorm Sandy, despite this event having scored below the threshold that clearly indicates the need to send a team.

6. The Committee urges NIST to continue its vital role as an impartial provider of factual, science-based information for the code development process.

7. The Committee recommends that NIST collect data on fires following events such as hurricanes. The National Fire Incident Reporting System (NFIRS) is intended to capture fire data but in fact leaves gaps in the data. Among these are the location of buildings or landmarks destroyed by the disaster and the details of fire department response to the event. NIST staff trained in mass disaster data collection and armed with a simple collection and recording system would greatly enhance the usefulness of NFIRS.